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Construction Begins on Water Control Structures at Great Dismal Swamp National Wildlife Refuge

Work Will Increase Resiliency and Reduce Impacts of Floods and Wildfires

Suffolk, Va. — Construction work has begun on a \$3.13 million project to install, repair or replace 12 water control structures at [Great Dismal Swamp National Wildlife Refuge](#) (NWR) to better manage refuge water levels for fire suppression, habitat management and flood risk to nearby communities. The project is funded by the [U.S. Fish and Wildlife Service under the Hurricane Sandy Disaster Relief Appropriations Act of 2013](#).

The construction phase of the project is expected to last nine months. During this time, defunct water control structures inside the Portsmouth Ditch Trailhead entrance will be replaced or repaired, and additional structures will be installed to expand groundwater storage and offset drainage impacts to approximately 30,000 acres in the refuge. The Portsmouth Ditch Trailhead will be closed to the public at the Big Entry Ditch Bridge for the duration of the project.

“This project will restore a natural water balance to the refuge and help protect local communities from the impacts of a changing climate,” said Wendi Weber, [Northeast Regional Director for the U.S. Fish and Wildlife Service](#). “By improving water management, the project can help reduce the risk of flooding from intense storms and dampen the impacts of wildfires and the massive release of carbon that comes with them.”

Refuge Manager Chris Lowie said that in addition to reducing both flood and fire impacts, the project will help improve conditions for carbon sequestration of peat soils, improve and protect water quality for nearby communities, and improve habitat for wildlife.

[Great Dismal Swamp NWR](#) consists of 112,000 acres of forested wetlands straddling the border of southeastern Virginia and northeastern North Carolina. It is the last intact remnant of a vast swamp ecosystem that once spanned more than 1 million acres. Prior to its establishment as a refuge in 1974, the area was heavily modified for agriculture and timber use, including the creation of 200 miles of ditches, roads and a canal.

This historical use, coupled with growing urban development surrounding the refuge, has taken a toll on the area's natural hydrology. Rather than the relatively slow and diffuse overland and groundwater flow across long distances that existed in pre-development conditions, water now collects and drains locally through the extensive ditch network in a relatively rapid manner. Therefore, peat soils no longer hold the ground and surface waters necessary to keep them wet, leaving the landscape more dry and susceptible to wildfire. At the same time, flooding occurs more frequently in adjacent communities during heavy rains.

"For over 250 years, the Great Dismal Swamp has been reshaped to fit different human needs, and this project will help restore important hydrological functions to the swamp that benefit both nature and people," said Michael Lipford, Executive Director of [The Nature Conservancy Virginia Chapter](#). "We're pleased to see the Great Dismal Swamp NWR taking these important steps to improve the health of one of the nation's iconic wetland forests."

While drought and flooding are a natural part of this ecosystem that can't be prevented entirely, their frequency and intensity will likely increase with climate change. This project is targeted at reducing the impacts from these events, so there will be less damage to people, wildlife and habitats.

In 2008 and 2011, two major fires ripped through the refuge, costing more than \$20 million to suppress. The 2008 fire was particularly destructive, burning for more than 100 days. According to a report by the U.S. Environmental Protection Agency, hospital visits for smoke-related health impacts were up immediately during and following a similar 2008 fire just over the state border in North Carolina.

"There are 1.5 million people living within an hour from the refuge that can be affected by our wildfires," said Lowie. "People were smelling the smoke all the way up in Philadelphia and Washington, D.C."

The effect of this smoke is also considerable in terms of carbon pollution. Peat soils are made of carbon-rich decomposed plant matter – when they burn, they release millions of metric tons of carbon into the atmosphere. The 2008 and 2011 wildfires at Great Dismal Swamp emitted an estimated 4 million metric tons of carbon.

Since the fires, hydrologists from the [U.S. Geological Survey](#) have been monitoring groundwater levels and the peat soils' moisture content, and have developed a computer model to simulate the effects of different water management strategies, said Mark Bennett, director of USGS' Virginia and West Virginia Water Science Center.

"We are working with the Fish and Wildlife Service to understand the connections between surface water and groundwater flows," said Bennett, a hydrologist. "The Refuge managers need that information to restore the swamp and improve its water management. The research is also attracting scientists who want to study other aspects of swamp ecosystems. They can use the data we're collecting to see the connection between the Great Dismal Swamp's hydrology and its ecology."

The project also aims to strengthen community flood protection. With better water management, the refuge can improve the water storage capacity of the soil and help reduce future storm-related flooding, which has been a persistent problem for nearby communities in Chesapeake, Va.

In 1999, Hurricane Floyd resulted in overflow of the swamp canal, which created water quality issues for the town of Chesapeake's drinking supply. In 2003, Hurricane Isabel caused extreme road flooding and blew down rare forest communities at the refuge, which later contributed to several wildfires.

Hurricanes Irene and Sandy both dropped high amounts of rain in a short period of time, resulting in flooding to nearby communities and farms.

Partners in this project are the [U.S. Geological Survey Land Carbon Program](#), [U.S. Geological Survey Virginia Water Science Center](#), [North Carolina Dismal Swamp State Park](#), [U.S. Army Corps of Engineers](#), the Cities of Chesapeake and Suffolk, Virginia, [The Nature Conservancy](#) and several others.

[View photos of the water management project](#) and learn more about U.S. Fish and Wildlife Service [Hurricane Sandy recovery and resilience projects](#).

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